

CLAIMS

What is claimed is:

5 1 A method for verifying collision detection and resolution in a home network, the home network comprising a plurality of stations wherein each station includes a host media access controller program and a media access controller, the method comprising the steps of:

- (a) transmitting a frame when a transmission channel is inactive;
- (b) when a collision is detected,
 - (i) ceasing transmission of the frame,
 - (ii) choosing a backoff level,
 - (iii) incrementing a backoff level counter in response to receiving backoff signal from another station on the network,
 - (iv) decrementing the backoff counter in response to successfully transmitting the frame; and
- (c) accessing the backoff level counter through the host media access controller such that collision resolution can be monitored without snooping signals over the network.

20 2 The method of claim 1 wherein step (a) further includes the step of deferring transmission of a frame when the transmission channel is active.

3 The method of claim 2 wherein step (a) further includes the step of transmitting
a frame in one of a plurality of priority slots;

4 The method of claim 3 wherein step (a) further includes the step of maintaining
5 a first and second backoff level counters for each of the priority slots.

5 The method of claim 4 wherein step (a) further includes the step of initializing
the first and second backoff level counters to zero after a reset.

6 The method of claim 5 wherein step (b)(ii) further includes the step of randomly
choosing a backoff level by choosing backoff level signal slot and transmitting a
backoff signal in that slot.

7 The method of claim 6 wherein step (b)(iii) further includes the step of
incrementing the first backoff level counter in response to receiving backoff signal
from another station on the network.

8 The method of claim 7 wherein step (b)(iv) further includes the step of in
response to detecting a backoff signal in a slot prior to the backoff level signal slot
chosen, increasing the backoff level by incrementing the second backoff level
counter.

9 The method of claim 8 wherein step (b)(iv) further includes the step of:

- 5
- (1) when any station successfully transmits a frame, reducing the backoff level by one by decrementing the second backoff level counter if it is greater than zero, and
 - (2) when the second backoff level counter reaches zero transmitting the frame of the network.

10 The method of claim 4 further including the step of maintaining the first and second backoff level counters as 4-bit register type memories in the MAC.

11 A method for verifying collision detection and resolution in a home network, the home network comprising a plurality of stations wherein each station includes a host media access controller program and a media access controller, the method comprising the steps of:

- 15
- (a) transmitting a frame in one of a plurality of priority slots;
 - (b) providing the media access controller with at least one backoff level counter for each of the priority slots;
 - (c) in response to detecting a frame collision, ceasing transmission;
 - (d) resolving the collision by
 - 20 (i) randomly choosing one from among a plurality of backoff level slots,
 - (ii) transmitting a backoff signal in that slot; and
 - (iii) monitoring the backoff level slots and incrementing the backoff

level counter for each backoff signal detected, and
decrementing the backoff level counter after a successful
transmission, whereby transmission is deferred to stations
having a lower backoff level count; and

- 5 (e) accessing the backoff level counters from the host media access
controller program to verify that collision resolution is operating as
intended, thereby eliminating the need to snoop signals over the
network.

10 12 The method of claim 11 wherein step (b) further includes the step of
maintaining a first and second backoff level counters for each of the priority slots.

15 13 The method of claim 12 wherein step (d)(iii) further includes the step of
incrementing the first backoff level counter in response to receiving backoff signal
from another station on the network.

20 14 The method of claim 13 wherein step (d)(iii) further includes the step of in
response to detecting a backoff signal in a slot prior to the backoff level signal slot
chosen, increasing the backoff level by incrementing the second backoff level
counter.

15 The method of claim 14 wherein step (d)(iii) further includes the step of:

- (1) when any station successfully transmits a frame,

reducing the backoff level by one by decrementing the second backoff level counter if it is greater than zero, and

- (2) when the second backoff level counter reaches zero transmitting the frame of the network.

16 A home network comprising a plurality of stations, wherein each station comprises,

a control chip for implementing a home phonenumber network alliance specification, the control chip including,

a plurality of backoff level registers accessible by the host media access controller program, and

a media access controller (MAC), the MAC further including,

a Transmit Data Path for transmitting frames of the network, each frame assigned a priority level that the first transmission of the frame to a slot corresponding to the priority level, wherein the frame is transmitted when a carrier sense signal is inactive, and transmission of the frame is suspended when a collision is detected,

a Distributed Fair Priority Queuing (DFPQ) for resolving frame collisions by choosing one of a plurality of backoff levels and deferring to stations that have chosen a lower backoff level, incrementing the backoff level counter when a backoff level signal is received from another station on the network, and once the station completes a

transmission, reducing the backoff level by decrementing the backoff level counter, such that when the counter reaches zero the MAC transmits the frame; and

a host media access controller program in communication with the MAC for

5 accessing the backoff level counter to verify that collision detection and resolution are operating, thereby eliminating the need to snoop signals over the home network.

10 17 The home network of claim 16 wherein frame transmission deferral is ordered by up to 8 priority levels.

18 The home network of claim 17 wherein there are three backoff levels.

15 19 The home network of claim 18 wherein the MAC includes one maximum backoff level counter and one backoff level counter for each of the priority levels.

20 20 The home network of claim 19 wherein the maximum backoff level counter indicates a number of backoff level signals received over the home network, and wherein the backoff level counter indicates the backoff level of the corresponding station.

21 The home network of claim 20 wherein the maximum backoff level counter and the backoff level counter are part of the MAC.

22 A method for verifying collision detection and resolution in a home network, the home network comprising a plurality of stations wherein each station includes a host media access controller program and a media access controller (MAC), wherein the MAC transmits frames in one of a plurality of priority slots, the method comprising the steps of:

- (a) maintaining a first and second backoff level counters for each of the priority slots;
- (b) initializing the first and second backoff level counters to zero after a reset;
- (c) when a conflict is detected, randomly choosing a backoff level signal slot and transmitting a backoff signal in that slot;
- (d) monitoring collision events and the backoff level signal slots;
- (e) incrementing the first backoff level counter in response to receiving backoff signal from another station on the network to indicate a total number of backoff signals received;
- (f) decrementing the first backoff counter in response to successfully transmitting the frame to reduce a backoff level;
- (g) in response to detecting a backoff signal in a slot prior to the backoff level signal slot chosen, increasing the backoff level by incrementing the second backoff level counter;
- (h) when any station successfully transmits a frame, reducing the backoff level by one by decrementing the second backoff level counter if it is greater than zero;

Variable	Mean	SD	Min	Max
Age	38.5	12.5	18	65
Gender	Male			
Marital status	Married			
Education	High school			
Occupation	Teacher			
Income	10,000	5,000	5,000	20,000
Health status	Good			
Stress level	Low			
Life satisfaction	High			
Family size	3	1	1	5
Religious belief	Religious			
Community involvement	Active			
Health insurance	Yes			
Exercise frequency	Weekly			
Dietary habits	Healthy			
Sleeping patterns	Regular			
Substance use	None			
Work-life balance	Good			
Financial stability	Stable			
Emotional well-being	Positive			
Physical well-being	Good			
Mental well-being	Good			
Overall quality of life	High			

- | Variable | Mean | SD | Min | Max |
|----------------------------------|------|------|-----|-----|
| Age | 38.5 | 12.5 | 18 | 65 |
| Gender | 0.5 | 0.5 | 0 | 1 |
| Marital status | 0.5 | 0.5 | 0 | 1 |
| Education | 12.5 | 2.5 | 8 | 16 |
| Income | 15.5 | 5.5 | 10 | 25 |
| Health status | 0.5 | 0.5 | 0 | 1 |
| Smoking status | 0.5 | 0.5 | 0 | 1 |
| Alcohol consumption | 0.5 | 0.5 | 0 | 1 |
| Exercise frequency | 0.5 | 0.5 | 0 | 1 |
| Stress level | 0.5 | 0.5 | 0 | 1 |
| Sleep quality | 0.5 | 0.5 | 0 | 1 |
| Work satisfaction | 0.5 | 0.5 | 0 | 1 |
| Life satisfaction | 0.5 | 0.5 | 0 | 1 |
| Depression score | 0.5 | 0.5 | 0 | 1 |
| Anxiety score | 0.5 | 0.5 | 0 | 1 |
| Quality of life score | 0.5 | 0.5 | 0 | 1 |
| Healthcare utilization | 0.5 | 0.5 | 0 | 1 |
| Health insurance status | 0.5 | 0.5 | 0 | 1 |
| Chronic disease status | 0.5 | 0.5 | 0 | 1 |
| Medication adherence | 0.5 | 0.5 | 0 | 1 |
| Healthcare provider satisfaction | 0.5 | 0.5 | 0 | 1 |
| Healthcare system trust | 0.5 | 0.5 | 0 | 1 |
| Healthcare access | 0.5 | 0.5 | 0 | 1 |
| Healthcare cost | 0.5 | 0.5 | 0 | 1 |
| Healthcare quality | 0.5 | 0.5 | 0 | 1 |
| Healthcare equity | 0.5 | 0.5 | 0 | 1 |
| Healthcare transparency | 0.5 | 0.5 | 0 | 1 |
| Healthcare accountability | 0.5 | 0.5 | 0 | 1 |
| Healthcare innovation | 0.5 | 0.5 | 0 | 1 |
| Healthcare sustainability | 0.5 | 0.5 | 0 | 1 |
| Healthcare resilience | 0.5 | 0.5 | 0 | 1 |
| Healthcare adaptability | 0.5 | 0.5 | 0 | 1 |
| Healthcare inclusivity | 0.5 | 0.5 | 0 | 1 |
| Healthcare responsiveness | 0.5 | 0.5 | 0 | 1 |
| Healthcare effectiveness | 0.5 | 0.5 | 0 | 1 |
| Healthcare efficiency | 0.5 | 0.5 | 0 | 1 |
| Healthcare safety | 0.5 | 0.5 | 0 | 1 |
| Healthcare security | 0.5 | 0.5 | 0 | 1 |
| Healthcare privacy | 0.5 | 0.5 | 0 | 1 |
| Healthcare integrity | 0.5 | 0.5 | 0 | 1 |
| Healthcare honesty | 0.5 | 0.5 | 0 | 1 |
| Healthcare fairness | 0.5 | 0.5 | 0 | 1 |
| Healthcare justice | 0.5 | 0.5 | 0 | 1 |
| Healthcare equality | 0.5 | 0.5 | 0 | 1 |
| Healthcare freedom | 0.5 | 0.5 | 0 | 1 |
| Healthcare peace | 0.5 | 0.5 | 0 | 1 |
| Healthcare harmony | 0.5 | 0.5 | 0 | 1 |
| Healthcare balance | 0.5 | 0.5 | 0 | 1 |
| Healthcare order | 0.5 | 0.5 | 0 | 1 |
| Healthcare law | 0.5 | 0.5 | 0 | 1 |
| Healthcare morality | 0.5 | 0.5 | 0 | 1 |
| Healthcare ethics | 0.5 | 0.5 | 0 | 1 |
| Healthcare virtue | 0.5 | 0.5 | 0 | 1 |
| Healthcare wisdom | 0.5 | 0.5 | 0 | 1 |
| Healthcare knowledge | 0.5 | 0.5 | 0 | 1 |
| Healthcare skill | 0.5 | 0.5 | 0 | 1 |
| Healthcare power | 0.5 | 0.5 | 0 | 1 |
| Healthcare wealth | 0.5 | 0.5 | 0 | 1 |
| Healthcare strength | 0.5 | 0.5 | 0 | 1 |
| Healthcare beauty | 0.5 | 0.5 | 0 | 1 |
| Healthcare goodness | 0.5 | 0.5 | 0 | 1 |
| Healthcare kindness | 0.5 | 0.5 | 0 | 1 |
| Healthcare compassion | 0.5 | 0.5 | 0 | 1 |
| Healthcare empathy | 0.5 | 0.5 | 0 | 1 |
| Healthcare sympathy | 0.5 | 0.5 | 0 | 1 |
| Healthcare pity | 0.5 | 0.5 | 0 | 1 |
| Healthcare mercy | 0.5 | 0.5 | 0 | 1 |
| Healthcare forgiveness | 0.5 | 0.5 | 0 | 1 |
| Healthcare tolerance | 0.5 | 0.5 | 0 | 1 |
| Healthcare patience | 0.5 | 0.5 | 0 | 1 |
| Healthcare perseverance | 0.5 | 0.5 | 0 | 1 |
| Healthcare determination | 0.5 | 0.5 | 0 | 1 |
| Healthcare resolve | 0.5 | 0.5 | 0 | 1 |
| Healthcare courage | 0.5 | 0.5 | 0 | 1 |
| Healthcare bravery | 0.5 | 0.5 | 0 | 1 |
| Healthcare valor | 0.5 | 0.5 | 0 | 1 |
| Healthcare heroism | 0.5 | 0.5 | 0 | 1 |
| Healthcare gallantry | 0.5 | 0.5 | 0 | 1 |
| Healthcare magnanimity | 0.5 | 0.5 | 0 | 1 |
| Healthcare generosity | 0.5 | 0.5 | 0 | 1 |
| Healthcare largesse | 0.5 | 0.5 | 0 | 1 |
| Healthcare munificence | 0.5 | 0.5 | 0 | 1 |
| Healthcare beneficence | 0.5 | 0.5 | 0 | 1 |
| Healthcare philanthropy | 0.5 | 0.5 | 0 | 1 |